

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of  
John R. MURPHY et al.

International Application No.  
PCT/US00/29231

International Filing Date:  
23 October 2000

For: VACCINE COMPOSITIONS

X

BOX SEQUENCE  
Commissioner for Patents  
Washington, D.C. 20231

STATEMENT ACCOMPANYING SEQUENCE LISTING

Sir:

Applicants enclose herewith the sequence listing in computer readable form (*i.e.*, a diskette) as well as a paper copy for the above referenced U.S. National application. The sequence listing does not include matter which goes beyond the content of the Application as filed and the information recorded on the diskette is identical to the written sequence listing.



Respectfully submitted,

LERNER, DAVID, LITTENBERG,  
KRUMHOLZ & MENTLIK, LLP

  
Gina Maldonado

Date: 6/15/01

600 South Avenue West  
Westfield, NJ 07090  
Telephone: (908)654-5000  
Facsimile: (908)654-7866

09260425000000000000000000000000

SEQUENCE LISTING

<110> Murphy, John R.  
O'Lear, Edward  
Harrison, Robert J.

<120> Vaccine Compositions

<130> AMSC 3.3-001

<140> To be assigned  
<141>

<150> PCT/US00/29231  
<151> 2000-10-23

<160> 36

<170> PatentIn Ver. 2.1

<210> 1  
<211> 24  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 1  
accagatctg ccgaaaaact tcga

24

<210> 2  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 2  
accagatctc cgcctttagt attta

25

<210> 3  
<211> 27  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: Native tox  
operator

<400> 3  
ataatttagga tagctttacc taattat

27

09868753 = 061204

<210> 4  
<211> 19  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: DNA target site

<400> 4  
gtaggtagg ctaacctat 19

<210> 5  
<211> 25  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence:  
Consensus-binding sequence

<220>  
<221> modified\_base  
<222> (1)...(25)  
<223> "n" represents variable bases

<400> 5  
ananttaggn tagnctannc tnnnn 25

<210> 6  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Variant DNA

<400> 6  
twaggttags ctaacctwa 19

<210> 7  
<211> 230  
<212> PRT  
<213> Mycobacterium tuberculosis

<400> 7  
Met Asn Glu Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
1 5 10 15

Asp Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
35 40 45

Glu Arg Asp Gly Leu Leu Arg Val Ala Gly Asp Arg His Leu Glu Leu  
 50 55 60  
 Thr Glu Lys Gly Arg Ala Leu Ala Ile Ala Val Met Arg Lys His Arg  
 65 70 75 80  
 Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu  
 85 90 95  
 Val His Ala Glu Ala Cys Arg Trp Glu His Val Asn Ser Glu Asp Val  
 100 105 110  
 Glu Arg Arg Leu Val Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe  
 115 120 125  
 Gly Asn Pro Ile Pro Gly Leu Val Glu Leu Gly Val Gly Pro Glu Pro  
 130 135 140  
 Gly Ala Asp Asp Ala Asn Leu Val Arg Leu Thr Glu Leu Pro Ala Gly  
 145 150 155 160  
 Ser Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
 165 170 175  
 Asp Ile Asp Leu Ile Thr Arg Leu Lys Asp Ala Gly Val Val Pro Asn  
 180 185 190  
 Ala Arg Val Thr Val Glu Thr Thr Pro Gly Gly Val Thr Ile Val  
 195 200 205  
 Ile Pro Gly His Glu Asn Val Thr Leu Pro His Glu Met Ala His Ala  
 210 215 220  
 Val Lys Val Glu Lys Val  
 225 230

<210> 8  
 <211> 223  
 <212> PRT  
 <213> *Corynebacterium diphtheriae*

<400> 8  
 Met Lys Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15  
 Glu Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
 20 25 30  
 Arg Leu Glu Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
 35 40 45  
 Glu Arg Asp Gly Leu Val Val Ala Ser Asp Ser Leu Gln Met Thr  
 50 55 60  
 Pro Thr Gly Arg Thr Leu Ala Thr Ala Val Met Arg Lys His Arg Leu  
 65 70 75 80

09868933-061201

09362221 061204

Ala Glu Arg Leu Leu Thr Asp Ile Ile Gly Leu Asp Ile Asn Lys Val  
85 90 95

His Asp Glu Ala Cys Arg Trp Glu His Val Met Ser Asp Glu Val Glu  
100 105 110

Arg Arg Leu Val Lys Val Lys Asp Val Ser Arg Ser Pro Phe Gly Asn  
115 120 125

Pro Ile Pro Gly Leu Asp Glu Leu Gly Val Gly Asn Ser Asp Ala Ala  
130 135 140

Ala Pro Gly Thr Arg Val Ile Asp Ala Ala Thr Ser Met Pro Arg Lys  
145 150 155 160

Val Arg Ile Val Gln Ile Asn Glu Ile Phe Gln Val Glu Thr Asp Gln  
165 170 175

Phe Gln Leu Leu Asp Ala Asp Ile Arg Val Gly Ser Glu Val Glu Ile  
180 185 190

Val Asp Arg Asp Gly His Ile Thr Leu Ser His Asn Gly Lys Asp Val  
195 200 205

Glu Leu Leu Asp Asp Leu Ala His Thr Ile Arg Ile Glu Glu Leu  
210 215 220

<210> 9

<211> 174

<212> PRT

<213> *Staphylococcus epidermidis*

<400> 9

Met Thr Val Ser Cys Pro Pro Pro Ser Thr Ser Glu Arg Glu Glu Gln  
1 5 10 15

Ala Arg Ala Leu Cys Leu Arg Leu Leu Thr Ala Arg Ser Arg Thr Arg  
20 25 30

Ala Glu Leu Ala Gly Gln Leu Ala Lys Arg Gly Tyr Pro Glu Asp Ile  
35 40 45

Gly Asn Arg Val Leu Asp Arg Leu Ala Ala Val Gly Leu Val Asp Asp  
50 55 60

Thr Asp Phe Ala Glu Gln Trp Val Gln Ser Arg Arg Ala Asn Ala Ala  
65 70 75 80

Lys Ser Lys Arg Ala Leu Ala Ala Glu Leu His Ala Lys Gly Val Asp  
85 90 95

Asp Asp Val Ile Thr Thr Val Leu Gly Gly Ile Asp Ala Gly Ala Glu  
100 105 110

Arg Gly Arg Ala Glu Lys Leu Val Arg Ala Arg Leu Arg Arg Glu Val

115

120

125

Leu Ile Asp Asp Gly Thr Asp Glu Ala Arg Val Ser Arg Arg Leu Val  
130 135 140

Ala Met Leu Ala Arg Arg Gly Tyr Gly Gln Thr Leu Ala Cys Glu Val  
145 150 155 160

Val Ile Ala Glu Leu Ala Ala Glu Arg Glu Arg Arg Arg Val  
165 170

<210> 10

<211> 225

<212> PRT

<213> *Mycobacterium leprae*

<400> 10

Met Asn Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
1 5 10 15

Asp Leu Glu Glu Glu Gly Ile Val Thr Pro Leu Arg Ala Arg Ile Ala  
20 25 30

Glu Arg Pro Thr Val Ser Gln Thr Val Ser Arg Met Glu Arg Asp Gly  
35 40 45

Leu Leu Arg Val Ala Gly Asn Arg His Leu Glu Leu Thr Thr Lys Gly  
50 55 60

Arg Ala Met Ala Ile Ala Val Met Arg Lys His Arg Leu Ala Glu Arg  
65 70 75 80

Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu Val His Ala Glu  
85 90 95

Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val Glu Arg Arg Leu  
100 105 110

Ile Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe Gly Asn Pro Ile  
115 120 125

Pro Gly Leu Leu Asp Leu Gly Ala Gly Pro Asp Ala Ser Ala Ala Asn  
130 135 140

Ala Lys Leu Val Arg Leu Thr Glu Leu Pro Ser Gly Ser Pro Val Ala  
145 150 155 160

Val Val Val Arg Gln Leu Thr Glu His Val Asp Asp Ile Asp Leu Ile  
165 170 175

Thr Arg Leu Lys Asp Thr Gly Val Val Pro Asn Ala Arg Val Thr Val  
180 185 190

Glu Thr Ser Pro Ala Gly Asn Val Ile Ile Ile Ile Pro Gly His Glu  
195 200 205

Asn Val Thr Leu Pro His Glu Met Ala His Ala Val Lys Val Glu Lys  
210 215 220

Val  
225

<210> 11  
<211> 230  
<212> PRT  
<213> *Mycobacterium tuberculosis*

<400> 11  
Met Asn Glu Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
1 5 10 15

Asp Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
35 40 45

Glu Arg Asp Gly Leu Leu Arg Val Ala Gly Asp Arg His Leu Glu Leu  
50 55 60

Thr Glu Lys Gly Arg Ala Leu Ala Ile Ala Val Met Arg Lys His Arg  
65 70 75 80

Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu  
85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val  
100 105 110

Glu Arg Arg Leu Val Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe  
115 120 125

Gly Asn Pro Ile Pro Gly Leu Val Glu Leu Gly Val Gly Pro Glu Pro  
130 135 140

Gly Ala Asp Asp Ala Asn Leu Val Arg Leu Thr Glu Leu Pro Ala Gly  
145 150 155 160

Ser Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
165 170 175

Asp Ile Asp Leu Ile Thr Arg Leu Lys Asp Ala Gly Val Val Pro Asn  
180 185 190

Ala Arg Val Thr Val Glu Thr Thr Pro Gly Gly Val Thr Ile Val  
195 200 205

Ile Pro Gly His Glu Asn Val Thr Leu Pro His Glu Met Ala His Ala  
210 215 220

Val Lys Val Glu Lys Val  
225 230

<210> 12  
 <211> 233  
 <212> PRT  
 <213> *Mycobacterium smegmatis*

<400> 12  
 Met Asn Asp Leu Val Asp Thr Thr Glu Asn Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15

Asp Leu Glu Glu Glu Gly Val Val Pro Leu Arg Ala Arg Ile Ala Glu  
 20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
 35 40 45

Glu Arg Asp Gly Leu Leu His Val Ala Gly Asp Arg His Leu Glu Leu  
 50 55 60

Thr Asp Lys Gly Arg Ala Leu Ala Val Ala Val Met Arg Lys His Arg  
 65 70 75 80

Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Asp  
 85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Glu Val  
 100 105 110

Glu Arg Arg Leu Val Gln Val Leu Glu Asn Pro Thr Thr Ser Pro Phe  
 115 120 125

Gly Asn Pro Ile Pro Gly Leu Thr Glu Leu Ala Val Thr Pro Gly Val  
 130 135 140

Asn Thr Glu Asp Val Ser Leu Val Arg Leu Thr Glu Leu Pro Val Gly  
 145 150 155 160

Met Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
 165 170 175

Asp Thr Asp Leu Ile Gly Arg Leu Lys Glu Ala Gly Val Val Pro Asn  
 180 185 190

Ala Arg Val Thr Val Glu Ala Asn Asn Asn Gly Gly Val Met Ile Val  
 195 200 205

Ile Pro Gly His Glu Gln Val Glu Leu Pro His His Met Ala His Ala  
 210 215 220

Val Lys Val Glu Lys Val Glu Lys Val  
 225 230

<210> 13  
 <211> 174  
 <212> PRT

<213> *Mycobacterium tuberculosis*

<400> 13  
Met Thr Val Ser Cys Pro Pro Pro Ser Thr Ser Glu Arg Glu Glu Gln  
1 5 10 15  
  
Ala Arg Ala Leu Cys Leu Arg Leu Leu Thr Ala Arg Ser Arg Thr Arg  
20 25 30  
  
Ala Glu Leu Ala Gly Gln Leu Ala Lys Arg Gly Tyr Pro Glu Asp Ile  
35 40 45  
  
Gly Asn Arg Val Leu Asp Arg Leu Ala Ala Val Gly Leu Val Asp Asp  
50 55 60  
  
Thr Asp Phe Ala Glu Gln Trp Val Gln Ser Arg Arg Ala Asn Ala Ala  
65 70 75 80  
  
Lys Ser Lys Arg Ala Leu Ala Ala Glu Leu His Ala Lys Gly Val Asp  
85 90 95  
  
Asp Asp Val Ile Thr Thr Val Leu Gly Gly Ile Asp Ala Gly Ala Glu  
100 105 110  
  
Arg Gly Arg Ala Glu Lys Leu Val Arg Ala Arg Leu Arg Arg Glu Val  
115 120 125  
  
Leu Ile Asp Asp Gly Thr Asp Glu Ala Arg Val Ser Arg Arg Leu Val  
130 135 140  
  
Ala Met Leu Ala Arg Arg Gly Tyr Gly Gln Thr Leu Ala Cys Glu Val  
145 150 155 160  
  
Val Ile Ala Glu Leu Ala Ala Glu Arg Glu Arg Arg Arg Val  
165 170

<210> 14  
<211> 228  
<212> PRT  
<213> *Brevibacterium lactofermentum*

<400> 14  
Met Lys Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
1 5 10 15  
  
Glu Leu Glu Glu Glu Gly Ile Val Pro Leu Arg Ala Arg Ile Ala Glu  
20 25 30  
  
Arg Leu Glu Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
35 40 45  
  
Glu Arg Asp Gly Leu Val His Val Ser Pro Asp Arg Ser Leu Glu Met  
50 55 60  
  
Thr Pro Glu Gly Arg Ser Leu Ala Ile Ala Val Met Arg Asn Asp Arg  
65 70 75 80

Leu Ala Glu Arg Leu Leu Thr Asp Ile Ile Gly Leu Asp Ile His Lys  
                   85                  90                  95  
  
 Val His Asp Glu Ala Cys Arg Trp Glu His Val Met Ser Asp Glu Val  
                   100                  105                  110  
  
 Glu Arg Arg Leu Val Glu Val Leu Asp Asp Val His Arg Ser Pro Phe  
                   115                  120                  125  
  
 Gly Asn Pro Ile Pro Gly Leu Gly Glu Ile Gly Leu Asp Gln Ala Asp  
                   130                  135                  140  
  
 Glu Pro Asp Ser Gly Val Arg Ala Ile Asp Leu Pro Leu Gly Glu Asn  
                   145                  150                  155                  160  
  
 Leu Lys Ala Arg Ile Val Gln Leu Asn Glu Ile Leu Gln Val Asp Leu  
                   165                  170                  175  
  
 Glu Gln Phe Gln Ala Leu Thr Asp Ala Gly Val Glu Ile Gly Thr Glu  
                   180                  185                  190  
  
 Val Asp Ile Ile Asn Glu Gln Gly Arg Val Val Ile Thr His Asn Gly  
                   195                  200                  205  
  
 Ser Ser Val Glu Leu Ile Asp Asp Leu Ala His Ala Val Arg Val Glu  
                   210                  215                  220  
  
 Lys Val Glu Gly  
                   225  
  
 <210> 15  
 <211> 226  
 <212> PRT  
 <213> *Corynebacterium diphtheriae*  
  
 <400> 15  
 Met Lys Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
     1                  5                  10                  15  
  
 Glu Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
     20                  25                  30  
  
 Arg Leu Glu Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
     35                  40                  45  
  
 Glu Arg Asp Gly Leu Val Val Ala Ser Asp Arg Ser Leu Gln Met  
     50                  55                  60  
  
 Thr Pro Thr Gly Arg Thr Leu Ala Thr Ala Val Met Arg Lys His Arg  
     65                  70                  75                  80  
  
 Leu Ala Glu Arg Leu Leu Thr Asp Ile Ile Gly Leu Asp Ile Asn Lys  
     85                  90                  95  
  
 Val His Asp Glu Ala Cys Arg Trp Glu His Val Met Ser Asp Glu Val

100

105

110

Glu Arg Arg Leu Val Lys Val Leu Lys Asp Val Ser Arg Ser Pro Phe  
115 120 125

Gly Asn Pro Ile Pro Gly Leu Asp Glu Leu Gly Val Gly Asn Ser Asp  
130 135 140

Ala Ala Ala Pro Gly Thr Arg Val Ile Asp Ala Ala Thr Ser Met Pro  
145 150 155 160

Arg Lys Val Arg Ile Val Gln Ile Asn Glu Ile Phe Gln Val Glu Thr  
165 170 175

Asp Gln Phe Thr Gln Leu Leu Asp Ala Asp Ile Arg Val Gly Ser Glu  
180 185 190

Val Glu Ile Val Asp Arg Asp Gly His Ile Thr Leu Ser His Asn Gly  
195 200 205

Lys Asp Val Glu Leu Leu Asp Asp Leu Ala His Thr Ile Arg Ile Glu  
210 215 220

Glu Leu  
225

<210> 16  
<211> 230  
<212> PRT  
<213> *Mycobacterium tuberculosis*

<400> 16  
Met Asn Glu Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
1 5 10 15

Asp Leu Glu Glu Glu Gly Val Thr Pro Leu Arg Ala Arg Ile Ala Glu  
20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
35 40 45

Glu Arg Asp Gly Leu Leu Arg Val Ala Gly Asp Arg His Leu Glu Leu  
50 55 60

Thr Glu Lys Gly Arg Ala Leu Ala Ile Ala Val Met Arg Lys His Arg  
65 70 75 80

Leu Ala Glu Arg Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu  
85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val  
100 105 110

Glu Arg Arg Leu Val Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe  
115 120 125

Gly Asn Pro Ile Pro Gly Leu Val Glu Leu Gly Val Gly Pro Glu Pro  
 130 135 140

Gly Ala Asp Asp Ala Asn Leu Val Arg Leu Thr Glu Leu Pro Ala Gly  
 145 150 155 160

Ser Pro Val Ala Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
 165 170 175

Asp Ile Asp Leu Ile Thr Arg Leu Lys Asp Ala Gly Val Val Pro Asn  
 180 185 190

Ala Arg Val Thr Val Glu Thr Thr Pro Gly Gly Val Thr Ile Val  
 195 200 205

Ile Pro Gly His Glu Asn Val Thr Leu Pro His Glu Met Ala His Ala  
 210 215 220

Val Lys Val Glu Lys Val  
 225 230

<210> 17  
 <211> 235  
 <212> PRT  
 <213> *Mycobacterium smegmatis*

<400> 17  
 Met Asn Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15

Asp Leu Glu Glu Glu Gly Val Val Pro Leu Arg Ala Arg Ile Ala Glu  
 20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ser Arg Met  
 35 40 45

Glu Arg Asp Gly Leu Leu His Val Ala Gly Asp Arg His Leu Glu Leu  
 50 55 60

Thr Asp Lys Gly Arg Ala Leu Ala Val Ala Val Met Arg Lys His Arg  
 65 70 75 80

Leu Ala Glu Arg Leu Leu Val Asp Val Ile Leu Pro Trp Glu Asp Gly  
 85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Glu Val  
 100 105 110

Glu Arg Arg Leu Val Gln Val Leu Glu Asn Pro Thr Thr Ser Pro Phe  
 115 120 125

Gly Asn Pro Ile Pro Gly Leu Thr Glu Leu Ala Val Thr Pro Gly Val  
 130 135 140

Asn Thr Glu Asp Val Ser Leu Val Arg Leu Thr Glu Leu Pro Val Gly  
 145 150 155 160

Met Pro Val Ala Val Val Val Arg Gln Leu Thr Glu His Val Gln Gly  
 165 170 175  
 Asp Thr Asp Leu Ile Gly Arg Leu Lys Glu Ala Gly Val Val Pro Asn  
 180 185 190  
 Ala Arg Val Thr Val Glu Ala Asn Asn Asn Gly Gly Val Met Ile Val  
 195 200 205  
 Ile Pro Gly His Glu Gln Val Glu Leu Pro His His Met Ala His Ala  
 210 215 220  
 Val Lys Lys Lys Val Glu Lys Val Glu Lys Val  
 225 230 235

<210> 18  
 <211> 225  
 <212> PRT  
 <213> *Mycobacterium leprae*

<400> 18  
 Met Asn Asp Leu Val Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Tyr  
 1 5 10 15  
 Asp Leu Glu Glu Glu Gly Ile Val Thr Pro Leu Arg Ala Arg Ile Ala  
 20 25 30  
 Glu Arg Pro Thr Val Ser Gln Thr Val Ser Arg Met Glu Arg Asp Gly  
 35 40 45  
 Leu Leu Arg Val Ala Gly Asn Arg His Leu Glu Leu Thr Thr Lys Gly  
 50 55 60  
 Arg Ala Met Ala Ile Ala Val Met Arg Lys His Arg Leu Ala Glu Arg  
 65 70 75 80  
 Leu Leu Val Asp Val Ile Gly Leu Pro Trp Glu Glu Val His Ala Glu  
 85 90 95  
 Ala Cys Arg Trp Glu His Val Met Ser Glu Asp Val Glu Arg Arg Leu  
 100 105 110  
 Ile Lys Val Leu Asn Asn Pro Thr Thr Ser Pro Phe Gly Asn Pro Ile  
 115 120 125  
 Pro Gly Leu Leu Asp Leu Gly Ala Gly Pro Asp Ala Ser Ala Ala Asn  
 130 135 140  
 Ala Lys Leu Val Arg Leu Thr Glu Leu Pro Ser Gly Ser Pro Val Ala  
 145 150 155 160  
 Val Val Val Arg Gln Leu Thr Glu His Val Asp Asp Ile Asp Leu Ile  
 165 170 175  
 Thr Arg Leu Lys Asp Thr Gly Val Val Pro Asn Ala Arg Val Thr Val

180

185

190

Glu Thr Ser Pro Ala Gly Asn Val Ile Ile Ile Ile Pro Gly His Glu  
195 200 205

Asn Val Thr Leu Pro His Glu Met Ala His Ala Val Lys Val Glu Lys  
210 215 220

Val  
225

<210> 19  
<211> 230  
<212> PRT  
<213> Streptomyces lividans

<400> 19  
Met Ser Gly Leu Ile Asp Thr Thr Glu Met Tyr Leu Arg Thr Ile Leu  
1 5 10 15

Glu Leu Glu Glu Glu Gly Val Val Pro Met Arg Ala Arg Ile Ala Glu  
20 25 30

Arg Leu Asp Gln Ser Gly Pro Thr Val Ser Gln Thr Val Ala Arg Met  
35 40 45

Glu Arg Asp Gly Leu Val Ser Val Ala Ala Asp Arg His Leu Glu Leu  
50 55 60

Thr Asp Glu Gly Arg Arg Leu Ala Thr Arg Val Met Arg Lys His Arg  
65 70 75 80

Leu Ala Glu Cys Leu Leu Val Asp Val Ile Gly Leu Glu Trp Glu Gln  
85 90 95

Val His Ala Glu Ala Cys Arg Trp Glu His Val Met Ser Glu Ala Val  
100 105 110

Glu Arg Arg Val Leu Glu Leu Leu Arg His Pro Thr Glu Ser Pro Tyr  
115 120 125

Gly Asn Pro Ile Pro Gly Leu Glu Glu Leu Gly Glu Thr Asp Gly Ala  
130 135 140

Asp Pro Phe Leu Asp Glu Gly Met Val Ser Leu Ala Asp Leu Asp Pro  
145 150 155 160

Gly Gln Glu Gly Lys Thr Val Val Arg Arg Ile Gly Glu Pro Ile  
165 170 175

Gln Thr Asp Ala Gln Leu Met Tyr Thr Leu Arg Arg Ala Gly Val Gln  
180 185 190

Pro Gly Ser Val Val Ser Val Thr Glu Ser Ala Gly Gly Val Leu Val  
195 200 205

Gly Ser Gly Gly Glu Ala Ala Glu Leu Glu Ala Asp Thr Ala Ser His  
210 215 220

Val Phe Val Ala Lys Arg  
225 230

<210> 20  
<211> 215  
<212> PRT  
<213> *Staphylococcus epidermidis*

<400> 20  
Met Leu Thr Glu Glu Lys Glu Asp Tyr Leu Lys Ala Ile Leu Thr Asn  
1 5 10 15

Asp Gly Asp Val Ser Phe Val Ser Asn Lys Lys Leu Ser Gln Phe Leu  
20 25 30

Asn Ile Lys Pro Pro Ser Val Ser Glu Met Val Gly Arg Leu Glu Lys  
35 40 45

Glu Gly Tyr Val Glu Thr Lys His Tyr Lys Gly Ala Arg Leu Thr Glu  
50 55 60

Glu Gly Leu Lys Gln Thr Leu Asp Ile Ile Lys Arg His Arg Leu Leu  
65 70 75 80

Arg Leu Phe Leu Ile Glu Ile Leu Gln Tyr Asn Trp Glu Glu Val His  
85 90 95

Gln Glu Ala Glu Ile Leu Glu His Arg Ile Ser Asp Leu Phe Val Glu  
100 105 110

Arg Leu Asp Lys Ile Leu Asn Phe Pro Lys Thr Cys Pro His Gly Gly  
115 120 125

Val Ile Pro Arg Gly Asn Ser Asp Ala Ala Ala Pro Gly Thr Ser Ile  
130 135 140

Leu Asn Phe Glu Pro Gly Glu Arg Val Thr Val Arg Arg Val Arg Arg  
145 150 155 160

Asp Lys Thr Glu Leu Leu Val Tyr Leu Ser Ser Lys Asp Ile Tyr Ile  
165 170 175

Gly Asn Thr Val Glu Ile Val Ser Lys Asp Asp Thr Asn Lys Val Ile  
180 185 190

Ile Leu Lys Arg Asn Asp Ile Val Thr Ile Leu Ser Tyr Glu Asn Ala  
195 200 205

Met Asn Ile Phe Ala Glu Lys  
210 215

<210> 21

<211> 213  
 <212> PRT  
 <213> *Staphylococcus aureus*

<400> 21  
 Met Leu Thr Glu Glu Lys Glu Asp Tyr Leu Lys Ala Ile Leu Thr Asn  
 1 5 10 15

Asn Gly Asp Lys Asn Phe Val Thr Asn Lys Ile Leu Ser Gln Phe Leu  
 20 25 30

Asn Ile Lys Pro Pro Ser Val Ser Glu Met Val Gly Arg Leu Glu Lys  
 35 40 45

Ala Gly Tyr Val Glu Thr Lys Pro Tyr Lys Gly Val Arg Leu Thr Glu  
 50 55 60

Asp Gly Leu Thr His Thr Leu Asp Ile Ile Arg His Arg Leu Leu Glu  
 65 70 75 80

Leu Phe Leu Ile Glu Ile Leu Lys Tyr Asn Trp Glu Glu Val His Gln  
 85 90 95

Glu Ala Glu Ile Leu Glu His Arg Ile Ser Asp Leu Phe Val Glu Arg  
 100 105 110

Leu Asp Ser Leu Leu Asn Phe Pro Glu Thr Cys Pro His Gly Gly Val  
 115 120 125

Ile Pro Arg Asn Asn Glu Tyr Lys Glu Lys Tyr Ile Thr Thr Ile Leu  
 130 135 140

Asn Tyr Glu Pro Gly Asp Ile Val Thr Ile Lys Arg Val Arg Asp Lys  
 145 150 155 160

Thr Asp Leu Leu Ile Tyr Leu Ser Ser Lys Asp Ile Ser Ile Gly Asn  
 165 170 175

Glu Val Glu Ile Val Ser Lys Asp Glu Met Asn Lys Val Ile Ile Ile  
 180 185 190

Lys Arg Asn Asp Asn Val Ile Ile Val Ser Tyr Glu Asn Ala Met Asn  
 195 200 205

Met Phe Ala Glu Lys  
 210

<210> 22  
 <211> 222  
 <212> PRT  
 <213> *Enterococcus faecalis*

<400> 22  
 Met Thr Pro Asn Arg Glu Asp Tyr Leu Lys Leu Ile Phe Glu Leu Gly  
 1 5 10 15

Gly Asp Glu Val Lys Val Asn Asn Lys Gln Ile Val Ser Gly Leu Asp  
 20 25 30

Val Ser Ala Ala Ser Val Ser Glu Met Ile Ser Lys Leu Val Lys Glu  
 35 40 45

Asp Leu Val Glu His Ser Pro Tyr Gln Gly Val Gln Leu Thr Glu Lys  
 50 55 60

Gly Leu Lys Lys Ala Ser Thr Leu Ile Arg Lys His Arg Ile Trp Glu  
 65 70 75 80

Val Phe Leu Val Glu His Leu Asn Tyr Thr Trp Asn Asp Val His Glu  
 85 90 95

Glu Ala Glu Val Leu Glu His Val Thr Ser Gln Thr Leu Val Asn Arg  
 100 105 110

Leu Ala Asp Tyr Leu Asn His Pro Glu Phe Cys Pro His Gly Gly Val  
 115 120 125

Ile Pro Glu Asp Asn Gln Pro Ile His Glu Glu Lys Arg Gln Thr Leu  
 130 135 140

Thr Asp Tyr Pro Val Gly Thr Lys Ile Arg Ile Ala Arg Val Leu Asp  
 145 150 155 160

Glu Lys Glu Leu Leu Asp Tyr Leu Val Ser Ile Asp Leu Asn Ile Gln  
 165 170 175

Glu Glu Tyr Thr Ile Lys Glu Ile Ala Ala Tyr Glu Gly Pro Ile Thr  
 180 185 190

Ile Tyr Asn Glu Asn Lys Glu Leu Ser Val Ser Phe Lys Ala Ala Asn  
 195 200 205

Thr Ile Phe Val Glu Pro Leu Ile Arg Glu Ser Glu Glu Asn  
 210 215 220

<210> 23  
 <211> 215  
 <212> PRT  
 <213> *Streptococcus gordonii*

<400> 23  
 Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Cys Leu Tyr Glu Leu Gly  
 1 5 10 15

Thr Arg His Asn Lys Ile Thr Asn Lys Glu Ile Ala Gly Leu Met Gln  
 20 25 30

Val Ser Pro Pro Ala Val Thr Glu Met Met Lys Lys Leu Leu Ala Glu  
 35 40 45

Glu Leu Leu Ile Lys Asp Lys Lys Ala Gly Tyr Leu Leu Thr Asp Leu  
 50 55 60

0963682753 10642004

Gly Leu Lys Leu Val Ser Asp Leu Tyr Arg Lys His Arg Leu Ile Glu  
65 70 75 80

Val Phe Leu Val His His Leu Gly Tyr Thr Thr Glu Glu Ile His Glu  
85 90 95

Glu Ala Glu Val Leu Glu His Thr Val Ser Asp His Phe Val Glu Arg  
100 105 110

Leu Asp Gln Leu Leu Asp Tyr Pro Lys Ala Cys Pro His Gly Gly Thr  
115 120 125

Ile Pro Ala Lys Gly Glu Leu Leu Val Glu Lys His Lys Leu Thr Leu  
130 135 140

Glu Glu Ala Lys Glu Lys Gly Asp Tyr Ile Leu Ala Arg Val His Asp  
145 150 155 160

Asn Phe Asp Leu Leu Thr Tyr Leu Glu Arg Asn Gly Leu Gln Val Gly  
165 170 175

Lys Thr Ile Arg Phe Leu Gly Tyr Asp Asp Phe Ser His Leu Tyr Ser  
180 185 190

Leu Glu Val Asp Gly Gln Glu Ile Gln Leu Ala Gln Pro Ile Ala Gln  
195 200 205

Gln Ile Tyr Val Glu Lys Ile  
210 215

<210> 24  
<211> 217  
<212> PRT  
<213> Streptococcus mutans

<400> 24  
Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Ile Ile Tyr Glu Leu Ser  
1 5 10 15

Glu Arg Asp Glu Lys Ile Ser Asn Lys Gln Ile Ala Glu Lys Met Ser  
20 25 30

Val Ser Ala Pro Ala Val Ser Glu Met Val Lys Lys Leu Leu Leu Glu  
35 40 45

Asp Leu Val Leu Lys Asp Lys Gln Ala Gly Tyr Leu Leu Thr Lys Lys  
50 55 60

Gly Gln Ile Leu Ala Ser Ser Leu Tyr Arg Lys His Arg Leu Ile Glu  
65 70 75 80

Val Phe Leu Met Asn His Leu Asn Tyr Thr Ala Asp Glu Ile His Glu  
85 90 95

Glu Ala Glu Val Leu Glu His Thr Val Ser Asp Val Phe Val Glu Arg

100

105

110

Leu Asp Lys Phe Leu Asn Tyr Pro Lys Val Cys Pro His Gly Gly Thr  
115 120 125

Ile Pro Gly His Gly Gln Pro Leu Val Glu Arg Tyr Arg Thr Thr Leu  
130 135 140

Lys Gly Val Thr Glu Met Gly Val Tyr Leu Leu Lys Arg Val Gln Asp  
145 150 155 160

Asn Phe Gln Leu Leu Lys Tyr Met Glu Gln His His Leu Lys Ile Gly  
165 170 175

Asp Glu Leu Arg Leu Leu Glu Tyr Asp Ala Phe Ala Gly Ala Tyr Thr  
180 185 190

Ile Glu Lys Asp Gly Glu Gln Leu Gln Val Thr Ser Ala Val Ala Ser  
195 200 205

Gln Ile Tyr Ile Glu Lys Lys Ala Tyr  
210 215

<210> 25

<211> 216

<212> PRT

<213> Streptococcus pneumoniae

<400> 25

Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Cys Ile Tyr Glu Ile Gly  
1 5 10 15

Ile Asp Leu His Lys Ile Thr Asn Lys Glu Ile Ala Ala Arg Met Gln  
20 25 30

Val Ser Pro Pro Ala Val Thr Glu Met Ile Lys Arg Met Lys Ser Glu  
35 40 45

Asn Leu Ile Leu Lys Asp Lys Glu Cys Gly Tyr Leu Leu Thr Asp Leu  
50 55 60

Gly Leu Lys Leu Val Ser Glu Leu Tyr Arg Lys His Arg Leu Ile Glu  
65 70 75 80

Val Phe Leu Val His His Leu Asp Tyr Thr Ser Asp Gln Ile His Glu  
85 90 95

Glu Ala Glu Val Leu Glu His Thr Val Ser Asp Leu Phe Val Glu Arg  
100 105 110

Leu Asp Lys Leu Leu Gly Phe Pro Lys Thr Cys Pro His Gly Gly Thr  
115 120 125

Ile Pro Ala Lys Gly Glu Leu Leu Val Glu Ile Asn Asn Leu Pro Leu  
130 135 140

Ala Asp Ile Lys Glu Ala Gly Ala Tyr Arg Leu Thr Arg Val His Asp  
 145 150 155 160  
 Ser Phe Asp Ile Leu His Tyr Leu Asp Lys His Ser Leu His Ile Gly  
 165 170 175  
 Asp Gln Leu Gln Val Lys Gln Phe Asp Gly Phe Ser Asn Thr Phe Thr  
 180 185 190  
 Ile Leu Ser Asn Asp Glu Asp Leu Gln Val Asn Met Asp Ile Ala Lys  
 195 200 205  
 Gln Leu Tyr Val Glu Lys Ile Asn  
 210 215

093627534204  
 <210> 26  
 <211> 216  
 <212> PRT  
 <213> *Streptococcus pyogenes*  
 <400> 26  
 Met Thr Pro Asn Lys Glu Asp Tyr Leu Lys Cys Ile Tyr Glu Ile Gly  
 1 5 10 15  
 Ile Asp Leu His Lys Ile Thr Asn Lys Glu Ile Ala Ala Arg Met Gln  
 20 25 30  
 Val Ser Pro Pro Ala Val Thr Glu Met Ile Lys Arg Met Lys Ser Glu  
 35 40 45  
 Asn Leu Ile Leu Lys Asp Lys Glu Cys Gly Tyr Leu Leu Thr Asp Leu  
 50 55 60  
 Gly Leu Lys Leu Val Ser Glu Leu Tyr Arg Lys His Arg Leu Ile Glu  
 65 70 75 80  
 Val Phe Leu Val His His Leu Asp Tyr Thr Ser Asp Gln Ile His Glu  
 85 90 95  
 Glu Ala Glu Val Leu Glu His Thr Val Ser Asp Leu Phe Val Glu Arg  
 100 105 110  
 Leu Asp Lys Leu Leu Gly Phe Pro Lys Thr Cys Pro His Gly Gly Thr  
 115 120 125  
 Ile Pro Ala Lys Gly Glu Leu Leu Val Glu Ile Asn Asn Leu Pro Leu  
 130 135 140  
 Ala Asp Ile Lys Glu Ala Gly Ala Tyr Arg Leu Thr Arg Val His Asp  
 145 150 155 160  
 Ser Phe Asp Ile Leu His Tyr Leu Asp Lys His Ser Leu His Ile Gly  
 165 170 175  
 Asp Gln Leu Gln Val Lys Gln Phe Asp Gly Phe Ser Asn Thr Phe Thr  
 180 185 190

Ile Leu Ser Asn Asp Glu Asp Leu Gln Val Asn Met Asp Ile Ala Lys  
195 200 205

Gln Leu Tyr Val Glu Lys Ile Asn  
210 215

<210> 27  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Consensus  
sequence

<400> 27  
gtaggtagg ctaacctat 19

<210> 28  
<211> 19  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Consensus  
sequence

<400> 28  
ttaggtagg ctaacctaa 19

<210> 29  
<211> 19  
<212> DNA  
<213> *Cornyebacterium diphtheriae*

<400> 29  
ttaggatgc tttacctaa 19

<210> 30  
<211> 19  
<212> DNA  
<213> *Streptomyces pilosus*

<400> 30  
ttaggtagg ctcacctaa 19

<210> 31  
<211> 19  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: 16S ribosomal RNA

<400> 31  
ccagggatc taatcctgt

19

<210> 32  
<211> 19  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: 19 kDa antigen

<400> 32  
gcaggccagt gaaacctgt

19

<210> 33  
<211> 20  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: htrA homologue

<400> 33  
acaggtggtg ctcaaccacg

20

<210> 34  
<211> 20  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: phoP homologue

<400> 34  
gaaggttaacg ttcaaccaat

20

<210> 35  
<211> 20  
<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: adhB homologue

<400> 35  
gcaggtgacc gtcaaccgat

20

<210> 36  
<211> 19

<212> DNA  
<213> Unknown Organism

<220>  
<223> Description of Unknown Organism: narG homologue

<400> 36  
gaaggtcaac caaacaaga

19

09263753 064204